

WEIL, GOTSHAL & MANGES LLP

SUITE 100
1501 K STREET, N.W.
WASHINGTON, D.C. 20005
(202) 682-7000
FAX: (202) 857-0940

BRUCE H. TURNBULL
DIRECT LINE 202-682-7070
bruce.turnbull@weil.com

March 1, 2004

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Federal Communications Commission
Office of the Secretary
Attn: Broadcast Flag Certifications
c/o Natek, Inc.
236 Massachusetts Avenue, NE
Suite 110
Washington, DC 20002

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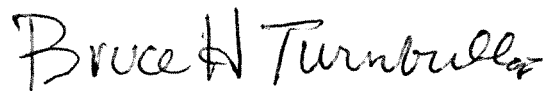
**Re: Digital Content Protections Technologies and
Recording Methods to be Used in Covered
Demodulator Products – CPRM Technology**

Dear Sir or Madam:

Enclosed please find a Broadcast Flag Certification submission on behalf of the 4C Entity, LLC ("4C").

Please do not hesitate to contact me at the telephone number above if you have any questions concerning this submission.

Sincerely,



Bruce H. Turnbull

cc: Chief, FCC Media Bureau

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)
)
Digital Content Protection Technologies and)
Recording Methods to be Used in Covered)
Demodulator Products)
)
CPRM Technology)

**CERTIFICATION OF
4C ENTITY, LLC
FOR APPROVAL OF ITS CONTENT PROTECTION RECORDABLE MEDIA FOR
VIDEO CONTENT (“CPRM-VIDEO”) AS
AN APPROVED DIGITAL CONTENT PROTECTION RECORDING METHOD**

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Exhibits

1. 4C CPRM/CPDM License Agreement (including Compliance and Robustness Rules)
2. 4C CPDM/CPRM Associate License Agreement for Resellers
3. 4C CPDM Digital Video Content Participation Agreement
4. C2 Block Cipher Specification
5. Content Protection for Recordable Media Specification – DVD Book
6. Content Protection for Recordable Media Specification – SD Memory Card SD-Video Part
7. Content Protection for Recordable Media Specification – Portable ATA Storage Book

Certification Statement

In response to the Public Notice issued on January 23, 2004, by the Federal Communications Commission (“FCC” or “Commission”), the 4C Entity, LLC (“4C”) hereby submits its certification that the Content Protection for Recordable Media for video recording (“CPRM-Video”),¹ developed and licensed by 4C and its four founding companies, meets the requirements for an Authorized Recording Method set forth in the Commission’s regulations at 47 C.F.R. §§ 73.9000-9008 (“Broadcast Flag regulations”) for the protection of Unscreened or Marked Content (as those terms are used in the Broadcast Flag regulations) originating as digital terrestrial broadcast video content and, accordingly, requests the Commission’s approval of CPRM-Video for such purposes.

Introduction and Summary

CPRM-Video is a technology allowing consumers to make copies of commercial entertainment content where consumer copying is authorized but the copyright holder for such content has decided to protect it from unauthorized copying and/or distribution (“protected content”). CPRM-Video is designed specifically for, and has been applied to, various removable consumer recording media types, including multiple forms of DVD recordable media, SD Memory Cards, Secure CompactFlash and Microdrive™ media.² A primary strength of CPRM-Video is enabling protected interchange of stored content among different devices such as between portable players manufactured by different companies. In short, CPRM-Video is designed for and well suited for use with removable or portable consumer recording media.

4C and its Founders – International Business Machines Corporation (“IBM”), Intel Corporation (“Intel”), Matsushita Electric Industrial Co., Ltd. (“Matsushita/Panasonic”) and Toshiba Corporation (“Toshiba”) – developed CPRM-Video and have for four years licensed CPRM-Video for the purpose of protecting digital video content in recording formats at definition levels up to standard definition. Content that originates in higher resolutions must be converted to the defined definition levels before being recorded using CPRM-Video. There are now over 100 licensees of 4C copy protection technology.

CPRM-Video uses proprietary methods for encryption (including local encryption), decryption and renewability for purposes of protecting certain digital content from unauthorized

¹ CPRM is adapted to recording of both audio-visual works (“video content” in this certification document) and pure audio works. Since this certification relates to video content, this document refers to “CPRM-Video” to describe the specific application relevant here, including both CPRM for standard definition video recording and CPRM for limited resolution video recording.

² Specifications applicable to each media format are attached as the following exhibits: Content Protection for Recordable Media Specification – DVD Book (Exhibit 5), Content Protection for Recordable Media Specification – SD Memory Card SD-Video Park (Exhibit 6), and Content Protection for Recordable Media Specification – Portable ATA Storage Book (Exhibit 7).

interception and copying. The Founders have licensed trade secrets for the CPRM-Video technology and copyrights in the CPRM Specifications to 4C, authorizing 4C to further sublicense these trade secrets and copyrights. (See Exh. 1, 4C CPRM/CPPM License Agreement §§ 2.2-2.3.) Founder-owned patent claims that are necessary to implement the CPRM Specification according to the license terms are licensed directly from the Founders to licensees in a “necessary claims” license grant. *Id.* For convenience, a single license document for all forms of intellectual property (“IP”) being licensed by the Founders and 4C, to implement the CPRM Specification according to the license terms, is available through 4C, with 4C acting as agent for its Founders in relation to the patent claim license grants.³

With respect to content required by the Commission’s regulations to be protected as Unscreened or Marked Content, 4C has established Specifications and Compliance Rules for CPRM-Video, which set forth how such content is to be marked in recorded form (setting identified bits to indicate that, while further copying of the content is permitted, the content is to be handled only in a protected manner when in digital form) and in permitted outputs on playback (utilizing the appropriate settings pursuant to the output technology employed in a particular case, including only protected forms of digital outputs). (See, e.g., 4C CPRM/CPPM License Agreement, Exh. C-3a §§ 3-4.) These requirements, and the corresponding actions by products compliant with them, fully satisfy the objective of protecting video content from unauthorized redistribution, as such objective is set forth in the Commission’s regulations and related Report and Order.

Responses to Specific Requirements

I. General Description

CPRM-Video enables consumers to make copies of protected content onto removable consumer recordable media such as recordable DVD disks⁴ while retaining the protection against

³ License administration and key generation are handled for 4C by License Management International (“LMI”) under a services contract between 4C and LMI. In addition to the efficiencies gained due to LMI’s experience in license administration, this arrangement also avoids having sensitive licensee information being directed to the Founders and enables LMI to screen such information from the Founders.

⁴ CPRM may be used with several DVD formats including DVD-R, DVD-RW and DVD-RAM and with various forms of flash memory (including SD Cards, Secure CompactFlash, and Microdrive™). All technical work has been completed for mapping CPRM to the +R/+RW formats of optical disc media as well, although one proprietor of that format has issues regarding the licensing of CPRM technology. Further, 4C remains open to applying the CPRM technology to any form of removable consumer recordable media where the media format will support the CPRM technology and where the proprietor of the format is willing to take the necessary steps to adopt the CPRM requirements for its format. 4C welcomes the opportunity to work with

further unauthorized copying and/or redistribution by binding the protected content to the physical medium and imposing license-based restrictions on playback of content from such media. In this sense, CPRM-Video neither acts as a "gate" to the recordable medium nor does it prevent the storage of unprotected content, or content protected using an alternative solution, onto such medium. Rather, CPRM-Video provides a method for a CPRM-Video-compliant device or application (such as a DVD recorder) to encrypt the protected content before it is stored and then to decrypt it for playback. (See, e.g., Exh. 5, Content Protection for Recordable Media Specification – DVD Book, §§ 5.2.1-5.2.2) By requiring licensed playback products to direct decrypted CPRM content only to outputs that are specifically authorized for the particular content being played back, the CPRM-Video protection system achieves the goal of restricting future copying or unauthorized redistribution. (See, e.g., Exh. 1, CPRM/CPPM License Agreement, Exh. C-3a § 4.)

As an encryption-based technology, in order for content to be protected with CPRM-Video, and for such content to be playable in intelligible form, recording products, playback products, and recording media must all contain appropriate elements of the proprietary encryption and decryption technology implemented pursuant to the CPRM-Video Specification. Specifically, a compliant recording product and a compliant playback product must contain an individual set of secret device keys and a table of secret cryptographic values, and the recordable media must contain a media key block (not secret) and a media identifier.⁵ (See, e.g., Exh. 5, Content Protection for Recordable Media Specification – DVD Book §§ 2.1, 3.). Since CPRM-Video uses the Media Identifier to generate the encryption and decryption keys, once the protected content is encrypted on to the medium, the protected content is bound to that medium.⁶ (See generally *id.* § 5.2.)

For example, if "Disc A" is a blank writable DVD disc, Disc A will contain a 64-bit Media Identifier specifying the medium, its manufacturer, and a 40-bit serial number that uniquely identifies the disc. When a CPRM-Video recorder records protected content onto Disc A, the encryption and decryption keys will be generated based in part on the unique Media Identifier of Disc A. Thus, if the CPRM protected video content from "Disc A" is directly copied to "Disc B", a player using Disc B will not generate the correct encryption and decryption keys to unlock the protected content.

proprietors of any such media formats to make the necessary adaptations so that CPRM will be useful for their media formats.

⁵ Because CPRM is intended to be adaptable to various media formats (including unknown future formats), the location of the media key block and media identifier applicable to the various media formats is specified separately for each medium.

⁶ CPRM is a multi-phase encryption process that involves the generation of other keys such as a Media Unique Key and a Title Key. Detailed descriptions of the encryption process for audio visual content can be found in the attached Exhibits 5, 6, and 7.

II. Detailed Analysis of the Level of Protection Afforded by CPRM-Video Technology

A. 4C License-Based Protections

1. General

As indicated above, CPRM-Video is an encryption-based technology that allows protected content (audio-visual content) to be recorded on to various media formats. CPRM-Video depends on a licensing regime to govern the conduct of manufacturers of devices and recordable media who utilize the CPRM-Video technology.⁷ With respect to the application of CPRM-Video to the various formats, 4C has developed detailed specifications for the manufacturers of devices that record onto and playback from these media formats to allow consumers to enjoy protected content using these formats.⁸ Adherence to those specifications is essential in order to manufacture CPRM-VIDEO-compliant devices or products.

The CPRM license requires licensees' products to comply with a set of compliance rules that prescribe how CPRM-Video compliant products must handle protected content (including robustness rules that prescribe how CPRM-Video compliant products must be designed and manufactured in order to resist attempts to circumvent the CPRM-Video technology). (See Exh. 1, 4C CPRM/CPPM License Agreement, Exhs. C-3a, C-3b, C-4.) For purposes of this Certification, an examination of the following describes how the compliance rules for video recorders and video players (with record and play-back features) effectively establish CPRM-Video as an effective recording and a redistribution control technology.

2. Requirements Applicable to Video Recorders

There are two circumstances relevant to the Broadcast Flag regulations regarding CPRM licensed video recorders – when content is received from a secure transmission technology that has been authorized to carry Marked or Unscreened Content; and when content is received through a covered demodulation function as Marked Content (after screening for the

⁷ For convenience (of both 4C and its licensees), a single “Adopter Agreement” (the 4C CPRM/CPPM License Agreement”) covers products implementing one or more of the 4C prerecorded audio (Content Protection for Prerecorded Media, or “CPPM”) technology and consumer recordable audio and audio-visual technologies. These are fundamentally the same technology, designed for use as a record and playback synergistic system. Many 4C licensees implement all forms of the technology, often in multi-function products employing all 4C technologies together. CPPM and both audio and audio-visual CPRM technologies are based on the same core cryptographic technologies, enabling multi-function products to be more easily designed and manufactured than if the functions had to employ separate cryptographies.

⁸ See *supra* note 3.

Broadcast Flag) or as Unscreened Content. (*See, e.g.*, Exh. 1, 4C CPRM/CPPM License Agreement, Exh. C-3a § 3.)

In the former case, CPRM-Video will accept content marked as requiring redistribution control by a Commission-approved protected interface⁹ and will permit recording of such content using CPRM-Video with the copy of the content then marked as requiring protection against unauthorized redistribution. (*See, e.g., id.* Section 3.3) Upon recording using CPRM-Video, such content will be marked according to the CPRM-Video Specifications to indicate this status. Output restrictions applicable to such content will then prevent such content from being passed to an unprotected digital output. Output restrictions are discussed in more detail below. In the Digital Transmission Content Protection (DTCP) case, “Encryption Plus Nonassertion” content pursuant to CPRM-Video specifications and compliance rules for marking such content. Output restrictions applicable to such content are discussed in detail below.

Similarly, if a CPRM-Video recording function receives content from an internal connection to an ATSC demodulator function (or via robust delivery of content from such an ATSC demodulator function), the CPRM-Video recording function will recognize and mark such content with an EPN designation in the recorded content.¹⁰ Output restrictions applicable to such content are also discussed in detail below.

3. Requirements Applicable to Playback of CPRM Protected Video Content

In contrast to input rules for video recorders, the compliance rules for video players prescribe the manner that content may be passed to outputs. (*See, e.g.*, Exh. 1, 4C CPRM/CPPM License Agreement, Exh. C-3a § 4.) A CPRM-compliant video player may pass Decrypted CPRM Video Content only to Authorized Secure Digital Outputs or analog outputs (using specified content control marking technologies).¹¹ (*See, e.g., id.* § 4.1.) Currently, the only Authorized Secure Digital Outputs approved for CPRM video content are those protected

⁹ 4C’s compliance rules do not limit the nature or type of content inputs but require that CPRM recording be done only in accordance with the rules associated with each particular input specifications and requirements and recognized content control information. In the Broadcast Flag context, if the Commission approves technology A for transmitting content from product-to-product, a CPRM-licensed recorder that utilizes technology A as an input for recording using CPRM-Video will respond to technology A’s designation of content as requiring protection from redistribution but permitting further copying.

¹⁰ 4C’s compliance rules for CPRM-Video were recently amended to incorporate Broadcast Flag related requirements and to clarify the CGMS-A input detection requirements. These modified compliance rules are attached hereto in Exhibit 1 and will be sent to Adopters within the next day or two. They will become final 30 days after the notice to Adopters is sent. If the notice period produces any further modifications, 4C will notify the Commission promptly.

¹¹ Because analog outputs are not regulated by the Commission’s Broadcast Flag rules, the 4C specific requirements related to analog outputs are not further described in this Certification document.

by either DTCP (Digital Transmission Content Protection) or HDCP (High bandwidth Digital Content Protection). (*See, e.g., id.* § 4.1.1-4.1.1.2.) Those technologies are the subject of separate submissions to the Commission in this proceeding detailing how they each protect against unauthorized redistribution of content.

4. Patents

All patent claims owned by the 4C Founders that meet the Adopter License definition of “Necessary Claims” are licensed. (*See* Exh. 1, 4C CPRM/CPPM License Agreement §§ 1.4.1, 2.2, 2.3.) Specific patents are not listed in the license, nor have they been otherwise identified by 4C or its Founders. The “Necessary Claims” approach to patent licenses is a common one in the technology industries, including specifically content protection technology licenses. This approach provides the licensee with access to claims which are owned by any Founder, Adopter or any Fellow Adopter, any Content Participant, or their respective affiliates, that are necessarily infringed by those portions of licensed products and licensed components which implement the 4C technology as set forth in the Specifications, subject to specified exclusions. In this context, a licensee need not fear a patent infringement claim being brought by a Founder against it sometime after signing the license for a patent that is not identified on an initial list. Similarly, the licensee is not required to promise not to assert patents that do not fit the narrow definition nor to withhold asserting patent claims in circumstances outside of the very specific context of the 4C technology implementations. (*See id.* § 2.5.) Further, patents that are issued to the licensor after the date of the license, but that contain “Necessary Claims,” are automatically added to the license. From the licensors’ perspective, this approach also avoids having to exhaustively review their patent portfolios to identify and evaluate claims to determine whether they are “necessary” to the implementation of a given technology, and for the licensee this approach eliminates uncertainties associated with such a detailed technical and legal analysis. In light of this licensing model and the fact that 4C itself is not a patent holder, 4C has not, and therefore does not in this filing, identify a list of specific patents and related claims. In 4C’s case, this approach has been accepted by over 100 companies that have signed the 4C license.

B. Applicability of Functional Criteria

1. Level of Security

As a recording method, CPRM-Video offers robust protection of content. First, CPRM-Video employs encryption using a cipher that was developed by the combination of cryptographic experts from its four founding companies and that has been subject to public scrutiny for at least the past three years (because it is published on 4C’s website).¹² (*See generally* Exh. 4, C2 Block Cipher Specification.) The only secrets that the CPRM-Video technology relies on for security are the cryptographic keys that are universally accepted as necessary to be kept secret in order for an encryption system to accomplish its purpose.

¹² The URL for the 4C Entity, LLC website is <http://www.4Centity.com>.

Accordingly, cryptographers have been free to examine, evaluate, and comment on CPRM-Video technology for this period. Notwithstanding this, to 4C's knowledge, there have been no public articles, papers, or lectures claiming to have "hacked" CPRM-Video technology (or, for that matter, even criticizing the security offered by CPRM-Video technology).

Second, CPRM-Video uses a key length of 56 bits, the longest usable without export restriction at the time the technology was first deployed. Since CPRM-Video is used in consumer electronics products that are not upgraded, this export-based key length limitation is inherent in any content protection system of this type. Third, a CPRM-Video-compliant device will record protected content only where the copyright holder has indicated that recording is permitted, by marking the content as copy freely or copy one generation. (*See supra* Discussion § II.A.2.) Fourth, CPRM-Video encrypts the content as it records the protected content onto the medium. (*See discussion supra* Section II.A.2.) As discussed above, the CPRM-Video recorded copy is cryptographically bound to the medium, and the technology effectively prevents any additional copies that can be intelligibly played back.

Similarly, once the content is bound to the medium it is equally effective at preventing unauthorized redistribution. The content can only be played back on CPRM-Video-compliant devices that are able to unlock the protected content.

2. Scope of Redistribution Control

See description above, Section II.A.3.

3. Means of Authentication

Authentication is a relevant concept in two different ways for CPRM-Video technology. First, because only CPRM-Video Compliant Products contain the keys, algorithms, and related technology necessary to decrypt the content, the encrypted content on the media and the CPRM-Video License playback product implicitly authenticate each other when a consumer seeks to play back the content from the media. Second, in the case of computer-based implementations of CPRM-Video, an explicit form of authentication is applied. (*See, e.g.*, Exh. 5, Content Protection for Recordable Media Specification – DVD Book § 6.) The process involves the drive authenticating the host through a challenge key, and in turn, the host authenticating the drive similarly by a challenge key. (*See, e.g., id.* § 6.1.) Successful decryption of the challenge key on each end indicates that the host and drive are valid because only licensed hosts and drive would have the correct algorithm to encrypt and decrypt the challenge key. From this process, a Bus Key is created at both ends so that a secure path can be established between the host and drive. The Bus Key is never exchanged over the path.

4. Upgradeability/Renewability/Ability to Revoke Compromised Devices

There are two forms of CPRM renewability or revocation. First, where a licensee has adopted the "standard" approach to device keys, each individual CPRM-enabled device

contains its own unique set of keys. (*See generally* 4C CPRM/CPPM License Agreement § 9.) This permits revocation of individual devices in the event that an individual key or set of keys is compromised (*i.e.*, published or found in an unauthorized clone implementation). Other CPRM enabled devices are not affected by this revocation. In this case, revocation of the compromised key or set of keys is accomplished through employment of new Media Key Blocks in newly made media. The new MKB will result in encrypted content that will not be capable of being decrypted by the device containing the revoked key or set of keys. Note that all other functions of that device are unaffected by this action, which affects only that device's ability to decrypt CPRM-Video content created using the new MKB.

Second, where a licensee has adopted a specific type of key, many products may contain the same set of device keys, but only where the licensee has also adopted an upgrading system such that keys are changed on a regular interval (and the effective revocation of the previous key or set of keys at the conclusion of a specified time period) and such that any compromise of the key or set of keys in use at a given time can be remedied through changing the keys used by legitimate devices (and, correspondingly, revoking the compromised key or set of keys). In this second case, revocation of the compromised key or set of keys is accomplished through the upgrade process employed by the licensee.

In the event that a key or set of keys (of either type described above) is apparently cloned, lost, or stolen, the determination that revocation of such a key or set of keys is the proper course of action is undertaken using a very careful process. (*See* 4C CPRM/CPPM License Agreement § 9.2.) If the licensee who was issued the key or set of keys in question agrees to the revocation, then the key or set of keys is revoked promptly after 4C is notified of the licensee's agreement. If the licensee objects to the revocation, then revocation occurs only after an independent arbitration process takes place, in which 4C and/or the relevant content companies may present evidence and argument as to why the key or set of keys should be revoked, the licensee is permitted to present evidence and argument as to why they key should not be revoked, and the independent arbitrator makes a determination based on the evidence and argument presented. (*See id.* § 9.5(a)(ii)-(iii).)

We note that the CPRM revocation capability operates in addition to (not in lieu of) any revocation capabilities of other protection methods that may be integrated within a given product.

5. Interoperability

CPRM-Video is fully interoperable to the extent that a specification exists for the media type and CPRM-Video recorded content is played back on CPRM-Video-compliant devices. As CPRM-Video is specifically designed to allow consumers to record protected content onto removable media while preventing indiscriminate copying of such content, CPRM-Video recorded content will not (and should not) play back on unlicensed devices. To the extent that CPRM-Video recorded content is found on unlicensed devices, the technology does not interfere in anyway with the functioning of those devices.

III. Information on Approval and Licensing of CPRM Technology

A. Content Owners and Program Distributors

4C Founders were all active participants in the Broadcast Protection Discussion Group meetings during the winter and spring of 2002. As part of that process, the Founders proposed that CPRM-Video would be a technology meeting the broadcast redistribution protection requirements that were discussed in that group. During the BPDG discussions, all MPAA members participating in the BPDG indicated their agreement with that assessment. This agreement was reiterated in the initial Broadcast Flag rulemaking proceeding. See Joint Comments of the Motion Picture Association of America, *et al.*, MB Docket 02-230 at 26 (Dec. 6, 2002).

4C has also received approval from the Digital Transmission License Administrator, LLC to permit content protected using DTCP to be recorded by CPRM-Video as an approved secure storage technology for such content. 4C understands that DTLA will, in its own submission in this proceeding, describe its process for approving secure storage technologies under its change process, but for purposes of this Certification document, 4C notes that DTLA's process includes consultation with content companies that have signed the DTLA Content Protection Agreement. 4C understands that DTLA's current approval of CPRM-Video as a secure storage technology was subject to that change process, and 4C takes that as a statement that DTLA's content licensees approve CPRM-Video as a secure storage technology for DTCP-protected content.

CPRM was submitted and approved by Japan's BS Digital Broadcast Promotion Association on August 27, 2003 as a secure recording method for making authorized copies of content distributed through Japan's digital satellite and terrestrial television broadcast system.¹³

B. Product Manufacturers

To date, over 100 product manufacturers have been licensed to produce CPRM compliant devices, including player/recorder manufacturers, semiconductor manufacturers, software implementers, licensed component resellers and content replicators. Products implementing CPRM-Video are offered in the U.S. consumer marketplace by many companies, using DVD-RAM, DVD-RW and SD cards to allow authorized recordings of video content using CPRM.

¹³ 4C notes for the Commission that Section 3.3 of its video compliance rules (for both standard definition and limited resolution) requires detection and response to CGMS-A and certain Macrovision technologies but only for CPRM-licensed video recorders that are made for sale in a country in which CPRM has been submitted for approval through a government law or regulation of the equivalent. The Japanese BS Digital Broadcast situation is an example of where this provision applies. 4C does not believe that the Commission's Broadcast Flag regulations or the approval of CPRM in the Broadcast Flag context would trigger application of the requirements of Section 3.3 for CPRM-licensed recorders made for the U.S. market.

C. Consumers

CPRM-Video was developed in order to offer consumers the opportunity make copies of certain types of video content and to use those copies in a flexible manner, suited to the expectations that consumers have developed for copies that they have made. That is, the content may be played in a variety of products (made by various different manufacturers, deployed in varying types of consumer environments, and including computer-based products as well as traditional “CE-type” products) that are identified as compliant with CPRM-Video, including the product on which the copy was originally made. 4C’s Founders themselves all have broad experience with this type of technology and with products that are used by consumers, and these companies have brought that broad and deep experience to the process of developing the CPRM-Video technology and the rules that products are required to follow in using it.

IV. License Terms and Conditions

In response to the Commission’s request for statements and information concerning license terms and conditions as part of this interim process, 4C offers the following statement and information concerning its licensing practices.¹⁴ First, licensing of CPRM-Video technology is available to manufacturers desiring to make CPRM-Video-compliant devices and media on reasonable and non-discriminatory terms. As indicated above, over 100 companies have licensed the 4C technology to date, and virtually all have signed the standard form Adopter Agreement without raising any questions. Where questions have arisen, 4C has engaged in constructive

¹⁴ 4C notes the fact that the Commission has not adopted a requirement that an approved technology in fact be licensed to the public, meaning that from a fundamental philosophical perspective, the Commission recognizes the principle that private intellectual property holders exercise ultimate discretion with respect to licensing matters. In this context and consistent with this principle, 4C does not believe that the Commission should approve or disapprove technologies on the basis of the terms on which they may or may not be offered to third parties. 4C does not believe that government regulation of private contracts is the path to consumer choice. Rather, 4C believes that the Commission should focus on creating competition in the marketplace by adopting procedures and guidelines that are focused on approving a variety of technologies so that competition can flourish in the marketplace, with implementor and consumer choice leading the way. In a regime in which an unlimited number of technologies may be listed as “approved” for protection and recording of Unscreened and Marked Content – and in which any participant in the market is free to develop and obtain Commission approval of its own proprietary technology, whether or not licensed to others – the Commission should simply rely on the marketplace to regulate licensing terms and conditions. 4C expects that multiple technologies for recording Unscreened or Marked Content will be offered for approval by the Commission and encourages the Commission to seek out and approve as many such technologies as possible.

dialogue with the prospective licensee and in every case save one has resolved every inquiry to the mutual satisfaction of both the company raising the question and 4C and its Founders.¹⁵

Second, 4C specifically views the licensing of its content protection technologies to be market-enabling. Although content protection technologies are not “features” which consumers are willing to pay extra for, they are a necessary part of a digital market infrastructure. In order for new products and new technologies to offer consumers exciting new features and functions, such products and technologies must have content to play, hear, view, record, and manipulate in new ways. Yet, in recent years, content companies have been increasingly reluctant to make content available to new technologies and products without some form of reasonable protections against unauthorized consumer copying and redistribution of their content. In fact, these broadcast flag proceedings are themselves recognition that content protection is an important part of the overall digital marketplace and ecosystem. In this context, 4C and its Founders have been active participants in enabling the digital marketplace by developing, deploying and offering to all third parties enabling content protection technologies like CPRM-Video.

So, it is apparent to 4C and its Founders that content protection-related technologies and the licenses for such technologies will not support commercial market license rates typically found in other contexts and that content protection must not add undue cost and functional burdens on products.¹⁶

Consequently, 4C’s license terms and conditions, including specifically its fees, are not “commercial rates,” typically found in other contexts. But, at the same time, each 4C Founder is willing to license these content protection technologies on these terms because the protections offered will enable the Founders themselves and those using the technologies to open and expand

¹⁵ The single exception is Philips. After a few sporadic inquiries by Philips at various points during the period 1999-2002, in the spring of 2003, Philips expressed a desire to engage in specific negotiations, and 4C, in response, engaged constructively with Philips from the spring of 2003 through September 2003, working toward what appeared to be another instance in which a company desiring to license 4C’s technology and 4C would be able to resolve issues raised by the prospective licensee. For reasons not entirely clear to 4C, in late September 2003, Philips hardened its positions on a few key points in the negotiation and began a series of public attacks on 4C and its licensing approach, including specifically in communications to the Commission in the last weeks before the November 2003 adoption of the Broadcast Flag regulations. While these actions effectively broke off the constructive dialogue that had seemed close to resolution, 4C remains willing to engage in further discussions with Philips and believes that, to the extent that Philips actually desires to use CPRM-Video technology, such discussions will produce an agreement on license terms on which 4C and Philips can both agree.

¹⁶ The validity of this view is perhaps most vividly demonstrated by the fact that the handful of companies that attempted to make content protection central to their business plans have either failed in the market, notwithstanding very attractive technologies and features, or have depended on mandates from the government and other content protection systems for their survival.

new markets, due to the fact that content will be made available for new technologies and products because of the protections afforded by the content protection technologies.

Third, the following particular elements of 4C license terms and conditions are of particular note:

(1) Basic license/scope of use. The Adopter Agreement covers use of the licensed IP solely in the context of specific products that implement the 4C technologies as those technologies are spelled out in the specifications, subject to the rules established in the compliance rules (including the robustness rules). (See Exh. 1, 4C CPRM/CPPM License Agreement § 2.4.) Uses of the same IP for other purposes would require a separate license from one or more of the 4C and/or its Founders. 4C expects that its Founders can and will make use of their patented technology in other contexts, but has explained to content companies that such other uses would be technically incompatible with 4C licensed uses (and, accordingly, would pose no “threat” to the integrity of the 4C content protection system, since content using the 4C technology will not play using the other technology, and vice versa.)

(2) Confidentiality. Since 4C developed its technology such that the Specifications, including the Specification covering its proprietary encryption algorithm, are public, very little 4C technology is confidential. Specifically, only certain cryptographic values (called “secret constants”) are “confidential” and only device keys are “highly confidential.” (See Exh. 1, 4C CPRM/CPPM License Agreement §§ 1.46, 1.16, 1.35, 5.) For the keys in particular, there are stringent requirements to maintain confidentiality, since failures of confidentiality concerning these values would threaten the value of the encryption and, hence, the content protection afforded by the encryption. (See *generally id.* § 5.) Indeed, disclosure of highly confidential information is subject to stringent penalties, and the use of cloned key information in non-licensed products may subject the keys involved to revocation (including in a licensee’s own licensed, compliant products). (See *id.* §§ 8.41, 9.)

(3) Compliance Requirements. A core requirement in the license is that a licensee must abide by the compliance rules (including the robustness rules) and specifications. Failure to do so can subject the licensee to both injunctive relief and significant liquidated damages. (See Exh. 1, 4C CPRM/CPPM License Agreement §§ 8.3, 8.42.)

(4) Necessary Claims. Patent IP is licensed based on patent claims that are necessary to implement the 4C technologies, as those technologies are disclosed with particularity in the specifications and subject to certain enumerated exceptions (*e.g.*, MPEG video technology is referenced and used in the specifications, but 4C does not intend to license MPEG technology through its license and MPEG technology is, accordingly, one of the enumerated exclusions). (See Exh. 1, 4C CPRM/CPPM License Agreement §§ 1.41, 2.4.) The approach of licensing all “necessary claims” within a narrow field of use particular to the specific technology is a common, and standard, means of patent licensing, especially in the technology-enabling area and, most particularly, in the content protection technology area.

(5) Reciprocal Non-Assertion. In partial consideration of the market-enabling license terms offered by 4C and its Founders, licensees (including signers of the content participant agreement) agree not to assert any “necessary claims” they might have against 4C, its Founders, and its licensees. (See Exh. 1, 4C CPRM/CPM License Agreement § 2.7.) As a general principle, requiring reciprocal non-asserts in conjunction with a patent license grant is a very common patent licensing practice, in industry consortia, industry standards activities, and in private strategic licensing activities. In market-enabling efforts like those engaged in by the 4C, reciprocal non-asserts create access to a “system” wherein all of the voluntary participants are free to develop products without fear of infringement claims brought by the other participants in the system, such that competition among participants is based on innovation with respect to product functions and features and by allowing companies to choose from various content protection approaches available in the market.

Creating a level playing field for participants is an important element to the market-enabling purpose of such a system and, accordingly, to its success, both from a fairness perspective and from the very real consideration that licensors in these circumstances are not in a position to indemnify licensees against patent infringement claims. Market-enabling structures simply do not support indemnity obligations, but participants in such a system have a reasonable expectation that they should be able to understand, in advance of making substantial investments in the system, what the actual licensing costs will be with respect to the system, at least with respect to the participants in the system.

In this context, some additional points are important to understanding 4C’s reciprocal non-assert.

- First, it must be understood in the context of the overall agreement – involving less-than-market rates as a market-enabling technology.¹⁷
- Second, the covenant is limited to “necessary claims” (*i.e.*, claims that are specifically necessary for the purpose of implementing the 4C technologies are disclosed with particularity in the specifications). Thus, a 4C adopter may still license or enforce a patent or a patent claim subject to the non-assert for all purposes other than implementation of 4C technologies as disclosed with particularity in the 4C specifications.
- Third, the 4C technologies are based on the same fundamental technology and were originally designed for use together in a record and playback system. Allowing one participant in that larger system to sue other participants in that same system on the basis that they are implementing a different part of the system undermines the overall system and a central purpose of the market-enabling licensing structure.
- Fourth, and extremely important from a practical perspective, the 4C technologies and licensing structure was developed more than 4 years ago, long before the commencement of the Broadcast Flag proceedings or even

¹⁷ See discussion *infra* Section IV(8).

the industry discussions in the Broadcast Protection Discussion Group. At this point, more than 100 companies have already licensed the 4C technology and have not only agreed to the market-enabling licensing structure offered by 4C, but have relied on it in making participation investments in the 4C system. Precluding these companies from using this technology to record broadcast television, or compelling them all to accept a different licensing structure at this late date, or otherwise exposing them to potential patent claims from their competitors that are also participants in this system, does not seem reasonable. During this long history, only a handful of companies (prospective licensees at the time) have raised any questions concerning this provision and, with the one exception noted above, none have objected to this provision after they have carefully reviewed the limitations of its coverage and its place in the overall 4C system and license structure.

(6) Keys and Key Expiration. 4C issues device keys, media key blocks, and media identifiers to its licensees in the appropriate categories. For device keys that have been lost or stolen or for device keys that have been cloned and appear in more than one CPRM enabled product, the license agreement provides a process for revoking the keys so that content will not be subjected to unlicensed devices and the overall system will be retained as a valuable content protection system. (*See* Exh. 1, 4C CPRM/CPPM License Agreement § 9.) Where a licensee disagrees with a proposed revocation, the license spells out a very careful system for adjudicating the issue of whether a key should be revoked, with a neutral arbitrator making the ultimate decision concerning key revocation. (*See id.* § 5.)

(7) Changes. The license prohibits 4C from making any material changes to specifications once they are released at version 1.0. (*See* Exh. 1, 4C CPRM/CPPM License Agreement § 3.3.1.) Currently, among the 4C specifications that are at version 1.0 is the C2 Cipher specification, along with others that are relevant to the complementary 4C technology for prerecorded content. The various CPRM format specifications currently licensed are at very high levels of maturity, and the conversion to version 1.0 will occur as soon as possible. In the meantime, no changes can be made, as a practical matter, that would cause incompatibilities or other materials modifications to product design. These constitute all of the core technologies necessary for CPRM-Video. As indicated above, CPRM-Video is intentionally designed to be applicable to a range of removable media and video formats, and, consequently, 4C continues to work on new specifications applying the core technologies to new media and/or video formats. Pursuant to the license, 4C is permitted to make changes in the compliance rules if such are necessary for the protection of content and adequate notice is provided for implementation in new products. (*See id.* § 3.3.)

(8) Fees. The license specifies two types of fees – annual administrative fees and unit fees for certain products and/or devices. (*See* Exh. 1, 4C CPRM/CPPM License Agreement § 4.) The annual administrative fees are for the purpose of enabling 4C Entity, LLC to administer the licensing system and are to be reduced as needed so that the overall fees collected

are reasonably aimed at the actual costs to administer the licensing system. (*See id.* §§ 4.1-4.2; *see also id.*, Exh. A.) If increases are necessary to meet increases in costs, these are permitted within certain limitations. Administrative fees are set based on a series of different categories in which a licensee may wish to use 4C technologies, with a maximum level applying to licensees utilizing 4C technologies in several categories. Unit fees are set for a number of the uses (although not for all uses)¹⁸ of 4C technologies. (*See id.* § 4.3; *see also id.*, Exh. B.) These fees are set for the duration of the agreement, subject to inflation adjustments no more frequently than once every three years. As indicated above, the unit fees were established at levels that were projected to be sufficient to allow the 4C Founders to recover, over a reasonable period of time, their costs of developing and maintaining the licensed technologies and to support the viability and robustness of the technology over many years of use. In any event, the combination of annual administrative fees and the unit fees is at a level that is well below levels that would be typical in normal commercial market settings for comparably complex technologies, but this lower level has been set in recognition of the factors outlined above in order to open markets for new products.

Fourth, 4C also offers a Content Participant Agreement. (*See* Exh. 3, 4C CPPM Digital Video Content Participation Agreement.) This license is offered in order to afford content companies that make their content available for recording using CPRM with certain rights regarding change processes and third party beneficiary status. With regard to changes, this agreement permits content companies to be given advance notice of proposed changes and the opportunity to object to any proposed changes that are material and adverse to their interests, including initiating and participating in an arbitration process to determine whether a change that 4C continues to desire to make is, in fact, material and adverse to the integrity or security of the 4C technology or to their rights as content participants. (*See id.* § 3.7.) If the neutral arbitrator finds for a content company in such a case, 4C is generally not permitted to make the change (subject to a very narrow exception for cases where 4C and/or its Founders may be subject to substantial legal liability in the absence of making the change). (*See id.* § 3.7(c)(ii).) With regard to third party beneficiary rights, a content company signing the Content Participant Agreement is given the right to take direct enforcement actions in court against any Adopter that reveals confidential or highly confidential information or whose products are materially non-compliant with the compliance rules (including robustness rules). (*See id.* § 3.4.)

V. Other Considerations

4C notes that the Commission may need to consider as part of its approval of CPRM-Video (and any other technology) adding certain obligations, called “Associated Obligations” in the Broadcast Protection Discussion Group context. In this regard, we propose the following

¹⁸ For example, SD recording and playback devices pay no unit fees for their device keys. SD-related unit fees are paid solely on the media used for recording and playing back CPRM encrypted content.

Associated Obligations to be imposed by the FCC on Covered Products as a condition of using CPRM as an Authorized Recording Method

When recording Unscreened Content or Marked Content using CPRM, a Covered Product shall record the content as EPN Encoded Content, as that term is defined in the 4C CPRM License Agreement.

For all of the foregoing reasons, 4C respectfully requests that the Commission approved CPRM for video as an approved digital content protection recording method.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'J. Hoy', with a long horizontal flourish extending to the right.

John Hoy

Manager, 4C Entity, LLC
225 B Cochrane Circle
Morgan Hill, CA 95037
john.hoy@lmicp.com
408 776-2014 ext. 111

4C Entity/FCC Appendices

4C CPRM/CPPM License Agreement (including Compliance and Robustness Rules)	1
4C CPPM/CPRM Associate License Agreement for Resellers.....	2
4C CPPM Digital Video Content Participant Agreement.....	3
C2 Block Cipher Specification	4
Content Protection for Recordable Media Specification - DVD Book.....	5
Content Protection for Recordable Media Specification – SD Memory Card SD-Video Part	6
Content Protection for Recordable Media Specification Portable ATA Storage Book	7